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Seed Oysters Stressed by Low Spring Salinities in Virginia

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Marine Resource Advisory

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Excessive rainfall during the winter and spring of 1984 has depressed salinities below their usual values in Chesapeake Bay and its tributaries. Virginia Institute of Marine Science (VIMS) hydrographic surveys in mid-April and mid-May showed that salinities were about 5 parts per thousand (ppt) below normal values for the spring season. The James River oyster seed area is particularly stressed by high freshwater discharges because the James River watershed extends into the mountains and the Shenandoah Valley.

The VIMS surveys have shown that salinity levels at the James River Bridge, normally 10 to 12 ppt in the spring, are registering only 5 to 9 ppt this year. Salinity levels at Towles Point in the Rappahannock River, normally 11 ppt, are registering 7 to 9 ppt.

According to VIMS scientists, salinities have been near 0 ppt in the upper sector of the James River oyster seed area for several months. Zero salinity values were obtained during low slack water runs in April and May at important seed oyster beds such as Point of Shoals and Horsehead. About 5 to 7 percent mortality was observed April 24, 1984, and this has increased to 10 to 12 percent in recent days.

Oysters require a minimal salinity of 5 ppt to pump water. At lower salinities they close their shells and metabolism becomes anaerobic (without oxygen). At low temperatures, oysters become dormant and are very resistant to freshwater conditions, but when temperatures rise rapidly as they do in May, the combination of low salinities and rising water temperatures increases stress and some oysters may die. Under these circumstances, the valves of the oyster shells do not open, as they do in normal deaths, and mortalities are not evident until a month or more after death.

The prolonged duration of exposure to freshwater and salinities less than 5 ppt in the spring of 1984 threatens to cause serious mortalities in the James River seed area. Oystermen may not be fully aware of the extent of dead oysters in their seed stock until a month after transplanting. Localized summer-type rainfall will allow salinities to recover rapdily when sping runoff returns to normal. However, transplanting oysters to areas with salinities less than 5 ppt is risky.

During this critical period, VIMS scientists are monitoring salinity and temperature conditions weekly to keep concerned oyster growers informed. In an attempt to reduce impact on individual oyster growers, the scientists are working with growers on several of the river systems and suggesting strategies to reduce oyster mortalities.

Information in this Marine Resource Advisory was provided by Professor Dexter Haven and Professor Emeritus Jay Andrews of the Virginia Institute of Marine Science.

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